

## 8.1 Core Content: Linear functions and equations

(Algebra)

### Stimulus, Stem, and Prompt Rules

- Use Item Development Guidelines at the beginning of this document.
- Stimulus may include variables to represent unknown quantities in mathematical expressions, equations, or inequalities.
- Stimulus will define all variables.
- Items assessing 8.1 may include equations in forms other than slope intercept form.
- Items assessing 8.1.B will include positive coefficients only.
- Items assessing 8.1.B may include inequality symbols  $>$ ,  $\geq$ ,  $\leq$ ,  $<$ , or  $\neq$ .
- Items assessing 8.1.C will use at least two of the four: table, verbal description, graph, or symbolic expression.
- Items assessing 8.1.C may include inequalities.
- Items assessing 8.1.C and 8.1.D may include equations.
- Items assessing 8.1.E may include a verbal description, equation, table, or graph of a linear function.
- Items assessing 8.1.F may ask students to write a linear function.

### Performance Expectations

Items may ask students to:	C.C.	Format	Ctxt
<b>8.1.A</b> Solve one-variable linear equations.	1	MC,CP	N
<b>8.1.B</b> Solve one- and two-step linear inequalities and graph the solutions on the number line.	1	MC,SA	N
<b>8.1.C</b> Represent a linear function with a verbal description, table, graph, or symbolic expression, and make connections among these representations.	2	MC,SA	I
<b>8.1.D</b> Determine the slope and y-intercept of a linear function described by a symbolic expression, table, or graph.	1	MC,CP	N
<b>8.1.E</b> Interpret the slope and y-intercept of the graph of a linear function representing a contextual situation.	2	MC,SA	Y
<b>8.1.F</b> Solve single- and multi-step word problems involving linear functions and verify the solutions.	2	MC,SA	Y
<b>8.1.G</b> Determine and justify whether a given verbal description, table, graph, or symbolic expression represents a linear relationship.	(2)	NA	NA

## 8.2 Core Content: Properties of geometric figures

(Numbers, Geometry/Measurement)

### Stimulus, Stem, and Prompt Rules

- Use Item Development Guidelines at the beginning of this document.
- Stimulus may include illustrations of two-dimensional and three-dimensional figures and objects.
- All four quadrants of the Cartesian plane may be used.
- Grids will have the origin and scales labeled.
- Items that require students to represent transformations will include grids.
- Pre-images and images of figures may have orientations other than vertical and horizontal.
- Items assessing 8.2.C that include polygons with 7, 9, or more sides will include a picture of a convex figure.
- Items assessing 8.2.D may include rotations about the origin or a vertex of a figure.
- Items assessing 8.2.D may include reflections over a vertical line, a horizontal line or the line  $y = x$ .

### Performance Expectations

Items may ask students to:	C.C.	Format	Ctxt
<b>8.2.A</b> Identify pairs of angles as complementary, supplementary, adjacent, or vertical, and use these relationships to determine missing angle measures.	1	MC,CP	N
<b>8.2.B</b> Determine missing angle measures using the relationships among the angles formed by parallel lines and transversals.	1,2	MC,CP	I
<b>8.2.C</b> <i>Demonstrate that the sum of the angle measures in a triangle is 180 degrees, and apply this fact to determine the sum of the angle measures of polygons and to determine unknown angle measures.</i>	1,2	MC,CP	I
<b>8.2.D</b> Represent and explain the effect of one or more translations, rotations, reflections, or dilations (centered at the origin) of a geometric figure on the coordinate plane.	1,2	MC,SA	I
<b>8.2.E</b> Quickly recall the square roots of the perfect squares from 1 through 225 and estimate the square roots of other positive numbers.	1	*	*
<b>8.2.F</b> <i>Demonstrate the Pythagorean Theorem and its converse and apply them to solve problems.</i>	2	MC,SA	I
<b>8.2.G</b> Apply the Pythagorean Theorem to determine the distance between two points on the coordinate plane.	1	MC,CP	I

\*This performance expectation may be included in items assessing core process performance expectations.

## 8.3 Core Content: Summary and analysis of data sets

(Algebra, Data/Statistics/Probability)

### Stimulus, Stem, and Prompt Rules

- Use Item Development Guidelines at the beginning of this document.
- Circles and the universal set will be provided for items requiring students to represent information in a Venn diagram.
- Items that ask students to construct a graph will include a title and a grid or circle.
- Items that ask students to construct a circle graph will include a circle and appropriate divisions within the circle of fourths, sixths, eighths, or twelfths.
- Items assessing 8.3.A may include mean, median, mode, range, interquartile range, and outliers.
- Items that assess 8.3.B may include box-and-whisker plots, stem-and-leaf plots, histograms, circle graphs, and line plots.
- Items assessing 8.3.F mutually exclusive events will include the word "or."

### Performance Expectations

Items may ask students to:	C.C.	Format	Ctxt
<b>8.3.A Summarize and compare data sets in terms of variability and measures of center.</b>	2	MC,SA	Y
<b>8.3.B Select, construct, and analyze data displays, including box-and-whisker plots, to compare two sets of data.</b>	2,3	MC,SA	Y
<b>8.3.C Create a scatterplot for a two-variable data set, and, when appropriate, sketch and use a trend line to make predictions.</b>	2	SA	Y
<i>8.3.D Describe different methods of selecting statistical samples and analyze the strengths and weaknesses of each method.</i>	(2)	NA	NA
<i>8.3.E Determine whether conclusions of statistical studies reported in the media are reasonable.</i>	(3)	NA	NA
<b>8.3.F Determine probabilities for mutually exclusive, dependent, and independent events from small sample spaces.</b>	2	MC,CP	Y
<b>8.3.G Solve single- and multi-step problems using counting techniques and Venn diagrams and verify the solutions.</b>	2	MC,SA	Y

## 8.4 Additional Key Content

(Numbers, Operations)

### Stimulus, Stem, and Prompt Rules

- Use Item Development Guidelines at the beginning of this document.
- Items assessing 8.4.B will use powers of ten from  $10^{-3}$  to  $10^9$ .
- Items assessing 8.4.C will use non-negative integer exponents less than or equal to ten.
- Items assessing 8.4.C may ask students to identify equivalent expressions.

### Performance Expectations

Items may ask students to:	<i>C.C.</i>	<i>Format</i>	<i>Ctxt</i>
<b>8.4.A</b> Represent numbers in scientific notation, and translate numbers written in scientific notation into standard form.	1	MC	I
<b>8.4.B</b> Solve problems involving operations with numbers in scientific notation and verify solutions.	2	MC,SA	I
<b>8.4.C</b> Evaluate numerical expressions involving non-negative integer exponents using the laws of exponents and the order of operations.	1	MC,CP	I
<b>8.4.D</b> Identify rational and irrational numbers.	1	MC	N